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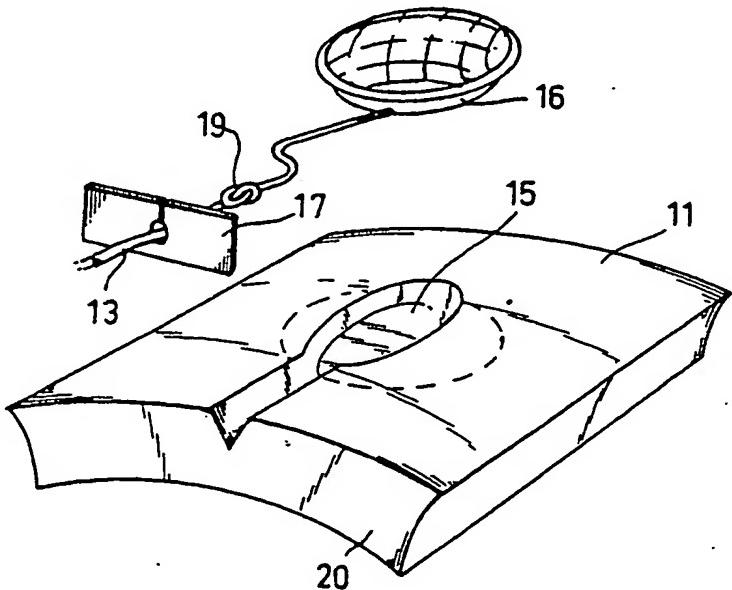
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: SLEEP INDUCING DEVICE



## (57) Abstract

A sleep inducing device (10) through which soothing recordings may be played to an infant. The device (10) has a speaker (16) concealed in a flat resilient pillow-like mounting pad (11) which may be supported beneath the mattress in a cot and a lead (13) securely fixed to the mounting pad (11) for connecting the speaker to a player.

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"SLEEP INDUCING DEVICE"

This invention relates to a sleep inducing device. Infants, especially in the first few weeks after birth, suffer stress from their worldly environment. This may result in the infant gaining less sleep than is desirable and this may cause long term effects in the personality of the child. Many parents have their own methods of soothing infants in order to put them to sleep and many devices have been proposed for this purpose. However, to date most proposals have not been widely accepted.

This invention aims to alleviate the abovementioned disadvantages and to provide methods of and apparatus for the promotion of sleep, particularly in infants. Other objects and advantages of this invention will hereinafter become apparent.

With the foregoing and other objects in view, this invention in one aspect resides broadly in a method of inducing a baby to sleep, the method including:- providing a resilient housing having a speaker assembly concealed therein; arranging the housing adjacent a mattress and playing soothing sounds through the speaker assembly to a baby resting on the mattress. The device may be used for infants and for this purpose it is preferred that the sound recording be a recording of the natural womb sounds as heard by the baby before birth. However of course other sounds may be used and these may range for example, from a lullaby to repetitive noises or other noises or sounds which are known to or may be found to promote sleep. Preferably the speaker assembly is concealed in a pillow like pad which may be placed unobtrusively adjacent the baby either beneath a mattress or the pillow used by the baby.

In another aspect this invention resides broadly in a sound reproduction device which may be used in the sleep inducement method described above and including a resilient

mounting supporting a speaker assembly having associated transmission means for transmitting a selected actuating signal thereto. Preferably the resilient mounting is a foam plastics pad which may be provided with a mounting cavity therein for receiving the speaker such that it may be completely concealed within the mounting pad.

It is also preferred that the speaker assembly is connected to a remote player by an extension lead, but of course if desired the speaker could be associated with a receiver within the mounting pad or the like for wireless transmission of the speaker assembly actuating signal. Preferably however the sound is recorded on tape and there is provided a flexible lead extending from the speaker assembly for connection to a tape player. The extension lead may be secured to the mounting pad by any suitable method so that tension applied to the lead remote from the mounting pad will be transferred to the mounting pad itself without tending to disconnect the joints between the lead and the speaker. Preferably the mounting pad is supported in a casing or envelope secured tightly about the mounting pad. This casing may be formed of fabric or a waterproof plastics material such as vinyl.

It is also preferred that the speaker concealed within the mounting pad is provided with a grille or mesh like covering or the like adapted to maintain the material of the mounting pad remote from the diaphragm of the speaker so that compression of the mounting pad will not adversely affect the performance of the speaker. In the preferred form the speaker and the leads therefrom are mounted in a foam plastics pad and adhered thereto by a suitable glue.

In a further aspect this invention resides broadly in a method of forming a sound reproduction device, the method including providing a foam plastics pad; forming a slit substantially parallel to the major opposed faces of the pad to provide opposed flap portions; fitting a speaker assembly

between said flap portions with the leads thereto extending beyond the pad; forming an abutment in the leads, and securing the flap portions together about the abutment.

5 In order that this invention may be more readily understood and put into practical effect, reference will now be made to the accompanying drawings which illustrate a typical embodiment of the present invention and wherein:-

- 10 FIG 1 is a perspective view of one form of sound reproduction device;
- 15 FIG 2 is a cross-sectional view taken along the lines 2-2 of FIG 1;
- FIG 3 is an exploded view showing components of the sound reproduction device of FIG 1, and
- 15 FIG 4 is a perspective view of a further embodiment of this invention.

In the embodiment illustrated in FIGS 1 to 3, the sound reproduction device 10 includes a rectangular mounting pad 11 of foam plastics material being approximately 200 millimetres square by 30 millimetres deep, encased by a tight fitting cover 12 and having an extension lead 13 extending away therefrom for connection to suitable sound reproduction apparatus. For this purpose the lead 13 may be provided with a connection jack 14 for connection to a tape player.

As can be clearly seen in FIG 2 the foam plastics pad 25 11 is provided with a central cavity 15 in which a loud speaker 16 is supported. The lead 13 passes into the pad 11 and connects to the speaker 16. A reinforcing strip 17 formed of relative rigid sheet plastics material is retained between the casing 12 and one end of the pad 11 and it is apertured so as to permit the lead 13 to pass freely therethrough. However the lead 13 is provided with an abutment 19 which may be a knot in the lead which is disposed inwardly of the adjacent side face 20 of the pad 11 and which is of such size that it cannot pass through the aperture 21 in the reinforcing strip 30 17. The portion 22 of the lead 13 which is supported within

the pad 11 is glued for retention therein so that it will not move relative to the speaker 16 sufficiently to break the connections between the lead and the speaker 16. For this purpose the lead portion 22 adjacent the speaker 16 is

5 relatively slack.

The casing 12 is preferably formed of a vinyl having welded seams, including an external seam 23 remote from the lead 13, whereby it forms a waterproof envelope about the mounting pad 11 such that the speaker assembly will not be

10 affected by moisture from a mattress and whereby it may be easily cleaned for purposes of hygiene.

Referring to FIG 3 it will be seen that the mounting pad 11 in which the speaker and leads are supported includes a cavity 15 and a slit 24 extending partway through the pad 11 from the cavity 15 to the end face 20. The speaker 16 is provided with a front grille 25 which protects the diaphragm of the speaker. The latter is inserted in the cavity 15 and preferably glue such as contact cement is placed on the underside face 26 of the speaker so as to glue it to the mounting pad 11. Glue is also placed along the faces of the slit 24 and on the portion 22 of the lead 13 including the abutment 19 nested within the slit 26 prior to the slit 24 being closed to retain the portion 22 and the abutment 19 therein. Thereafter the reinforcing strip 17, which is slit at 26 to facilitate engagement about the lead 13 is operatively positioned at the end face 20 about the lead 13 and the casing 12 is secured in position and enclosed by welding along the back seam 23.

25

In use the jack 14 is placed into a tape player or the like and a tape recording of the appropriate soothing sounds are played through the speaker 16. The pad is preferably placed beneath a mattress in a cot where it will be of minimum obstruction to a baby sleeping therein.

30 The sound reproduction device of the present invention is particularly useful for infants although it may

be used for adults if desired and it will be seen from the above description that there are no easily removable parts or hard projections which are accessible to the child or which may cause injury to the child. Furthermore rough handling of  
5 the device by an infant will not adversely affect the operation of the sound reproduction device.

The sound reproduction device 40 illustrated in FIG 4 is similar to that illustrated in FIGS 1 to 3. However in this embodiment the foam plastics mounting pad 41 is provided  
10 with an arcuate slit 42 between and parallel to the major faces 43 and 44 so that one side portion of the pad is formed into upper and lower flaps 45 and 46 which may be separated (as shown) to enable the speaker assembly 47 to be placed therebetween and secured by gluing the flaps 45 and 46  
15 together. The lead 48 from the speaker assembly 47 passes to a locating bar 49 about which it is tied prior to passing from the pad 41. The bar 49 is glued in place between the flaps to form a secure anchorage for the lead 48 in a manner that will minimise external hard spots in the device 40.  
20

It will of course be realised that while the above has been given by way of illustrative example of the invention, all such modifications and variations thereto as would be apparent to persons skilled in the art are deemed to fall within the broad scope and ambit of this invention as is defined in the appended claims.  
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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:-

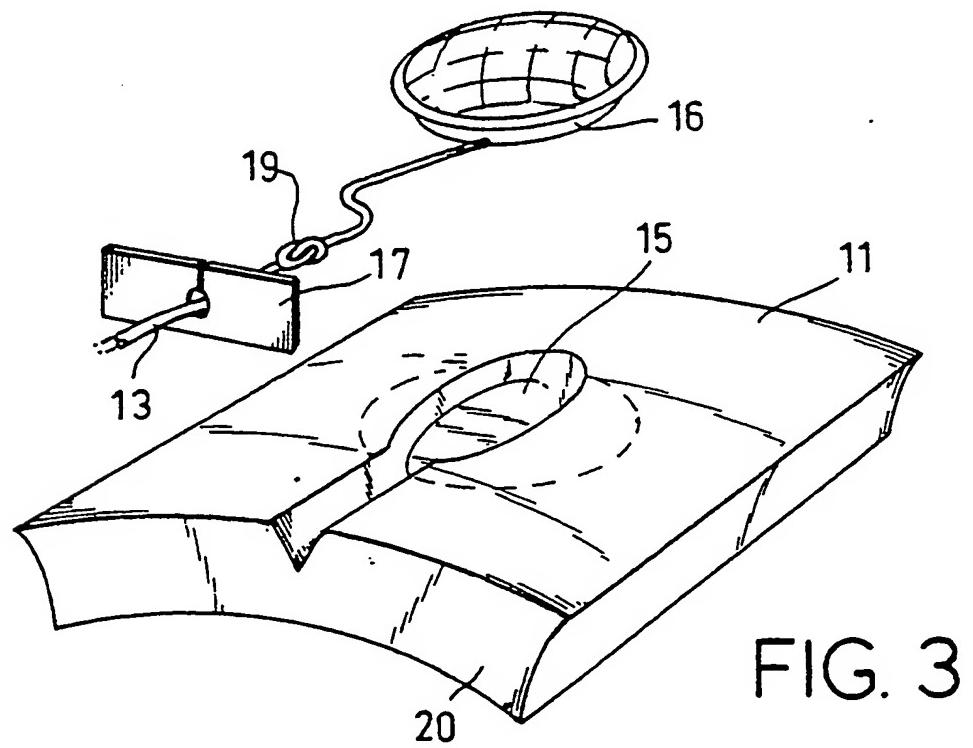
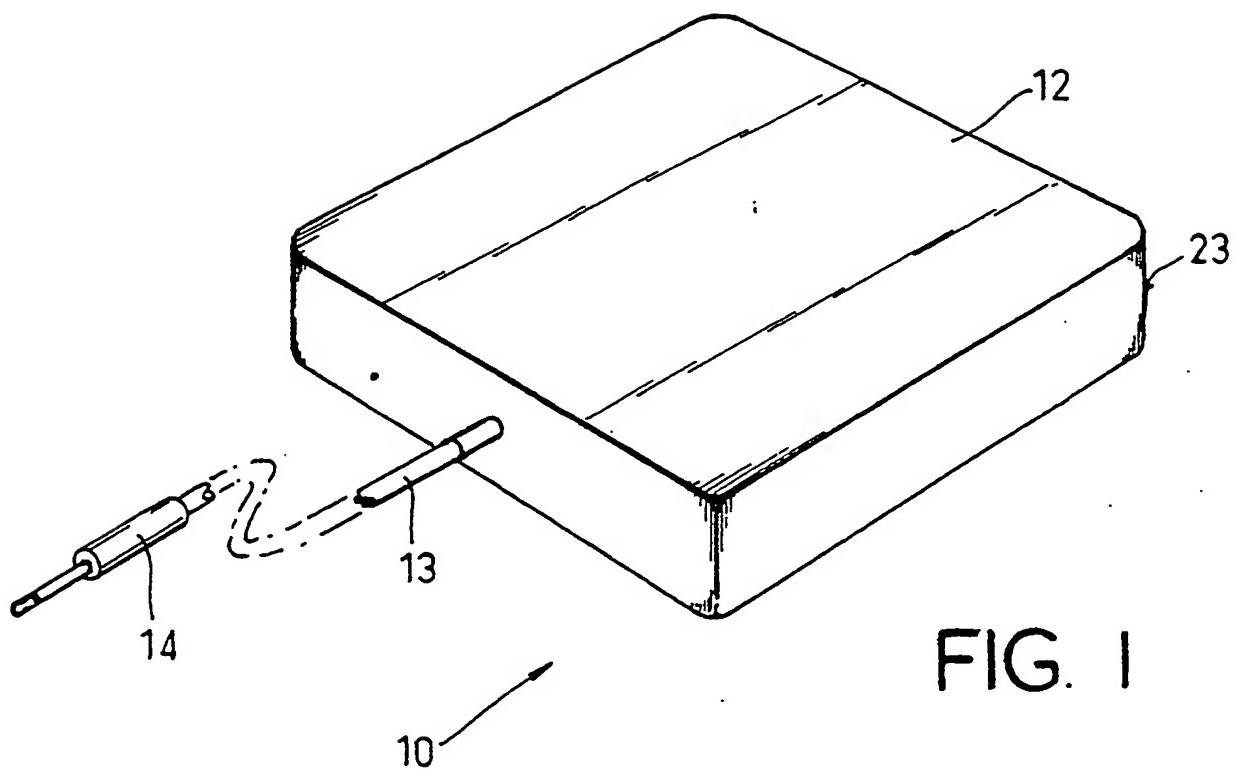
1. A method of inducing a baby to sleep, the method including:- providing a resilient housing having a speaker assembly concealed therein; arranging the housing adjacent a mattress and playing soothing sounds through the speaker assembly to a baby resting on the mattress.
2. A method of inducing sleep according to Claim 1, wherein the soothing sounds are a reproduction of natural womb sounds.
3. A method of inducing sleep according to Claim 1 or Claim 2, wherein the soothng sounds are recorded on tape for transmission from a remote tape player to the speaker assembly.
4. A sound reproduction device for use in the method defined in any one of Claims 1 to 3, including:- a resilient mounting supporting a concealed speaker assembly having associated transmission means for transmitting a selected actuating signal thereto.
5. A sound reproduction device according to Claim 4, wherein said resilient mounting is formed from a foam plastics material and is in the form of a pad which may be concealed unobtrusively beneath a babies mattress.
6. A sound reproduction device according to Claim 5, wherein said speaker assembly is provided with grill means adapted to maintain adequate clearance between the speaker diaphragm and the enveloping foam plastics material.
7. A sound reproduction device according to any one of Claims 4 to 6, wherein said transmission means is a flexible

lead which extends from the speaker assembly to retention means within the mounting pad and from the retention means to a plug-in connector.

8. A sound reproduction device according to Claim 7, wherein said retention means is a bar secured within the mounting pad with its axis substantially parallel to the opposed major faces of the pad.

9. A sound reproduction device according to Claim 7, wherein said pad is supported within a waterproof envelope.

10. A method of forming a sound reproduction device, the method including providing a foam plastics pad; forming a slit substantially parallel to the major opposed faces of the pad to provide opposed flap portions; fitting a speaker assembly between said flap portions with the leads thereto extending beyond the pad, forming an abutment in the leads, and securing the flap portions together about the abutment.



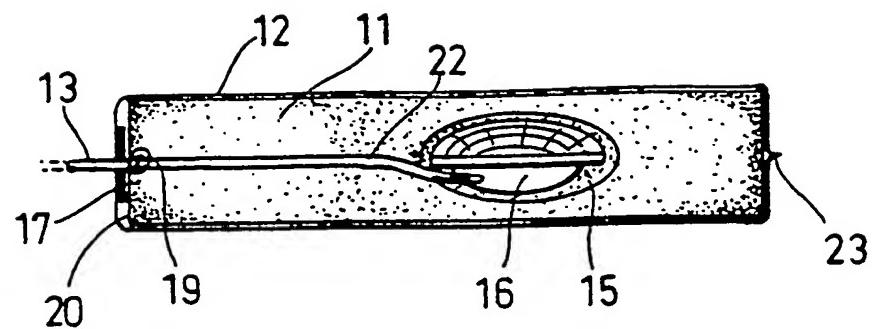
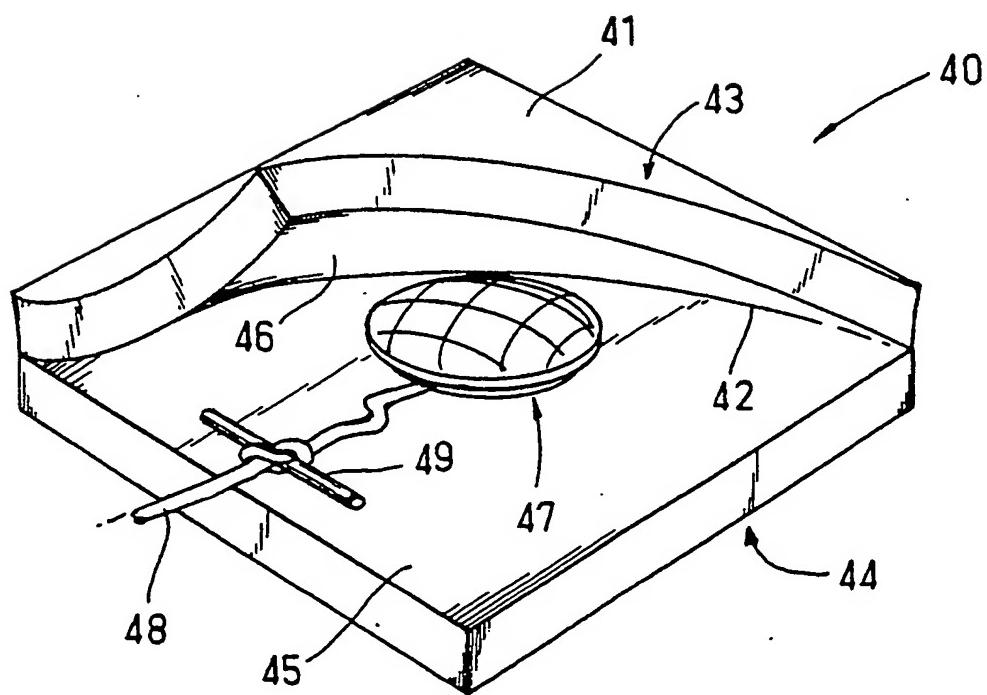


FIG. 2

FIG. 4



# INTERNATIONAL SEARCH REPORT

International Application No PCT/AU 86/00181

## I. CLASSIFICATION OF SUBJECT MATTER .<sup>4</sup> Several classification symbols apply. Indicate all.

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl. A61M 21/00, A61G 7/04

## II. FIELDS SEARCHED

Minimum Documentation Searched<sup>1</sup>

Classification System	Classification Symbols
IPC	A61M 21/00, A61G 7/04

Documentation Searched other than Minimum Documentation  
to the Extent that such Documents are Included in the Fields Searched<sup>2</sup>

AU : IPC as above

## III. DOCUMENTS CONSIDERED TO BE RELEVANT<sup>3</sup>

Category <sup>4</sup>	Citation of Document, <sup>5</sup> with indication, where appropriate, of the relevant passages <sup>6</sup>	Relevant to Claim No. <sup>7</sup>
X,Y	FR,A, 2129805 (SIMON) 3 November 1972 (03.11.72)	1-10
X,Y	DE,A, 2017544 (HAARHAUS) 28 October 1971 (28.10.71)	1-10
X,Y	US,A, 3563229 (PETRUSSON) 16 February 1971 (16.02.71)	1-10
X,Y	US,A, 3384074 (RAUTIOLA et al) 21 May 1968 (21.05.68)	1-10
X,Y	US,A, 4124022 (GROSS) 7 November 1978 (07.11.78)	1-10
X,Y	FR,A, 2079152 (ROY) 5 November 1971 (05.11.71)	1-10
X,Y	FR,A, 1403692 (CAILLEBOTTE) 17 May 1965 (17.05.65)	1-10

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## IV. CERTIFICATION

Date of the Actual Completion of the International Search

15 September 1986 (15.09.86)

Date of Mailing of this International Search Report

23 SEP 1986

International Searching Authority  
Australian Patent Office

Signature of Authorized Officer

A. HENDRICKSON

ANNEX TO THE INTERNATIONAL SEARCH REPORT ON  
INTERNATIONAL APPLICATION NO. PCT/AU 86/00181

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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Patent Document  
Cited in Search  
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Patent Family Members

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US 3563229 DE 1603635 FR 1557709

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END OF ANNEX